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Patent
TH1871Y (US)
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	)	
	)	
EDWARD R. EATON ;	)	
WYNDHAM H. BOON; and	)	
CHRISTOPHER J. SMITH	)	
	)	
Serial No. 10/074,834	)	Group Art Unit: 1751
	)	
Filed February 13, 2002	)	Examiner: Ogden Jr., N.
	)	
A NOVEL CHEMICAL BASE FOR FUEL CELL ENGINE HEAT EXCHANGE COOLANT/ANTIFREEZE	)	

COMMISSIONER FOR PATENTS
P. O. Box 1450
Alexandria, VA 22313-1450

Sir:

DECLARATION UNDER 37 CFR §1.132

Glenn Komplin declares as follows:

1. I am employed by Shell Global Solutions (US) Inc. as a Staff Research Engineer.

2. I received a Bachelor of Science in Chemical Engineering from the University of Wisconsin, Madison in 1984, and a Ph.D in Material Science from the University of Wisconsin, Madison in 1990.

3. I performed an experiment designed to measure the conductivity of aqueous solutions of 1,3-propanediol and deionized water. I prepared 3 solutions of 1,3-

propanediol/deionized water—1) a solution of 80 wt.% 1,3-propanediol and 20 wt.% deionized water; 2) a solution of 50 wt.% 1,3-propanediol and 50 wt.% deionized water; and; 3) a solution of 20 wt.% 1,3-propanediol and 80 wt.% deionized water. I then measured the conductivity of the three solutions at 24°C with an Orion Model 115 conductivity meter. The results are shown in Table 1 below where 1,3-propanediol is denoted as PDO and deionized water is denoted as DI water.

TABLE 1
(Conductivity of 1,3-propanediol/deionized water solutions in μSeimens/cm)

80% PDO/20% DI water	50% PDO/50% DI water	20% PDO/80% DI water
0.8	2.2	4.3

4. I performed an experiment designed to measure the conductivity of aqueous solutions of 1,3-propanediol and tap water. I prepared 3 solutions of 1,3-propanediol/tap water—1) a solution of 80 wt.% 1,3-propanediol and 20 wt.% tap water; 2) a solution of 50 wt.% 1,3-propanediol and 50 wt.% tap water; and; 3) a solution of 20 wt.% 1,3-propanediol and 80 wt.% tap water. I then measured the conductivity of the three solutions at 24°C with an Orion Model 115 conductivity meter. The results are shown in Table 2 below where 1,3-propanediol is denoted as PDO.

TABLE 2
(Conductivity of 1,3-propanediol/tap water solutions in μSeimens/cm)

80% PDO/20% tap water	50% PDO/50% tap water	20% PDO/80% tap water
9.2	72.5	273

5. The electrical resistivity of the 1,3-propanediol/deionized water solutions and the 1,3-propanediol/tap water solutions in ohms-cm may be calculated by dividing 1 by the conductivity of these solutions The electrical resistivity in Kohm-cm may be calculated from the electrical resistivity in ohm-cm by dividing the electrical resistivity in ohm-cm by 1000. The calculated electrical resisitivity of the 1,3-propanediol/deionized water solutions and the 1,3-propandiol/tap water solutions in Koh-cm is shown in Table 3 below, where 1,3-propanediol is denoted as PDO and deionized water is denoted as DI water.

TABLE 3

(Electrical resistivity of 1,3-propanediol water solutions in Kohm-cm)

	80%PDO/20% water	50%PDO/50% water	20%PDO/80%water
DI water	1250	455	232
Tap water	108	14	4

Glenn C Komplin

Date: December 4, 2006